REMARKS

The above amendment with the following remarks is submitted to be fully responsive to the Office Action of January 6, 2005. Reconsideration of this application in light of the amendment and the allowance of this application are respectfully requested.

Claims 1-13 were pending in the present application prior to the above amendment. In response to the Office Action, claims 1, 4 and 13 have been amended, and claim 3 has been canceled. Therefore, claims 1, 2, and 4-13 are still pending in the present application and are believed to be in proper condition for allowance.

The present invention is directed towards reducing the vehicle fuel consumption caused by compressor on-time. In particular, the present invention is primarily directed to a control system for the compressor of a vehicle air braking system which is capable of making real time calculations, or increases in the reservoir target pressures during the operation of a vehicle. In one advantageous implementation of the present invention, during a throttle-off mode (i.e. when there is no fuel consumption), the control system is adapted to set a higher target pressure than the normal target pressure for the reservoir at the vehicle's real time operating state. This ensures that the compressor will continue to generate pressure in the reservoir, in effect to create a buffer, when the engine is unloaded. As a result, compressor on-time during throttle-on modes (i.e. during fuel consumption) can be reduced, thereby also reducing fuel consumption (See Page 2, ¶5).

Referring now to the Office Action, the Examiner initially objected to the specification because headings and a brief description of the figure are missing. In response, the specification has been amended above to include headings and a brief description of the figure. Therefore, the withdrawal of this objection is requested.

In addition, claim 4 was rejected under 35 U.S.C. 112, second paragraph, as lacking proper antecedent basis for the limitation "the normal target pressure". In

response, this limitation has been amended above to recite "a normal target pressure". Therefore, the withdrawal of this rejection is also respectfully requested.

The Examiner also rejected claims 1-3, 8, and 12-13 under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,120,107 to Eslinger. The applicant respectfully disagrees for the reasons set forth below.

The cited Eslinger reference is directed to a system for independently controlling an air dryer for reducing unnecessary purging of its associated air reservoir. To achieve this, Eslinger discloses an electric control unit (ECU) that receives reservoir pressure signals, and compares it against predetermined reservoir pressure values, in particular, minimum and maximum allowable values for the reservoir. (See Col. 2, lines 23-26 and Col. 4, lines 31-33). This comparison is used to produce a purging signal when certain conditions are satisfied. Eslinger also teaches that if the reservoir pressure signals shows that the pressure is between these upper and lower limits, the control of the compressor depends on whether the vehicle's engine is being fueled or not. (See Col. 4, lines 47-50). If the engine is not being fueled and the pressure value is between the upper and lower limits, the ECU signals the compressor to load, in which case, pressure is increased in the reservoir without fuel being consumed by the compressor. (See Col. 4, lines 50-55).

However, the predetermined reservoir pressure values disclosed in Eslinger are set limits for the reservoir, presumably for safety reasons. Eslinger does not disclose, teach, or otherwise suggest calculation or alteration of such limits as attained by the present invention, nor is the system of Eslinger adapted or intended for use in such a manner. Therefore, the invention disclosed in Eslinger differs significantly from the present invention in which during a throttle-off mode when there is no fuel consumption, the control system is adapted to set a higher target pressure than the normal target pressure for the reservoir at the vehicle's real time operating state. In particular, Eslinger fails to disclose the means to calculate a target pressure as specifically recited in independent claims 1 and 13, and fails to disclose increasing the target pressure at a zero throttle opening as specifically

recited in independent claim 8. Moreover, there is no teachings or suggestions in Eslinger that the disclosed system should be modified to operate in the manner recited by the rejected independent claims of the present invention. Hence, the applicants respectfully contend that Eslinger fails anticipate the invention as claimed and that this rejection is improper. Therefore, the applicants request the withdrawal of this rejection and the allowance of claims 1-2, 8, and 12-13, claims 2 and 12 being patentable at least by the reason of their dependency on allowable claim 1, and claim 3 having been canceled.

Regardless of the above, to further expedite the prosecution and the allowance of the present application, independent claims 1 and 13 have been amended above to specifically recite that the target pressure is higher during throttle-off modes than throttle-on modes. Clearly, Eslinger and the other cited references of record fail to disclose, teach, or otherwise suggest the invention as presently claimed. Correspondingly, the allowance of these claims is requested.

Referring again to the Office Action, the Examiner rejected claims 1, 6, 7, and 13 under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 4,459,085 to Tonegawa. The applicants again disagree with the Examiner's rejection.

Tonegawa provides a pressure control system for a pneumatic supply line which activates a compressor during a light load engine operation to cut down overall fuel consumption of the engine. An unloading valve is arranged on the compressor which communicates with a reservoir. When the pressure in the reservoir rises beyond a predetermined value, the unloading valve causes the compressor to be in a relief or decompression state via a control unit, thereby adjusting the delivery of pressure to the reservoir. The control unit is "operable in two selective control modes" which are for heavy loads and light loads. (See Col. 3, line 45). In operation, while the engine is driven under heavy load, the pressure in the reservoir is progressively increased, as the compressor is driven. At the instant the reservoir pressure reaches the maximum value for the reservoir P2, the control unit causes the unloading valve to open so that the compressor is brought into a

decompression state. The decompression state continues until the reservoir pressure drops down to the level P1. (See Fig. 2a). P1 represents a fixed minimum threshold value for the reservoir to ensure that braking effect can be achieved during use of the vehicle.

When a light engine load is indicated, the control mode is switched to that shown in Fig. 2b so that when the reservoir pressure is at, or lower than, the maximum level P2, the control unit immediately disconnects the unloading valve from the reservoir. This sets up the compression state of the compressor, instead of the decompression state, to generate pressure in the reservoir. Hence, under light load, the compressor is able to generate pressure when the engine fuel consumption is minimal, reducing the total fuel consumption by a corresponding amount.

However, the system described in Tonegawa also does not disclose a means to calculate a target pressure as recited in independent claims 1 and 13, or disclose increasing the target pressure at a zero throttle opening as recited in independent claim 8 in the manner disclosed in the present invention. Rather, the system described in Tonegawa is configured to switch between two predetermined control states dependent upon a fixed upper threshold. Thus, the system described in Tonegawa provides a different solution for controlling the reservoir pressure than the present invention which utilizes the real time pressure calculations or variation in target pressure thresholds, and does not disclose each and every feature of the claims. In addition, Tonegawa also fails to disclose target pressure being higher during throttle-off modes than throttle-on modes as now specifically recited in the amended independent claims 1 and 13. Correspondingly, the withdrawal of this rejection and the allowance of claims 1-2, 8, and 12-13 are respectfully requested.

Referring again to the Office Action, claims 1, 6, 7, and 13 were rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,036,449 to Nishar et al. However, Nishar does not disclose, teach, or otherwise suggest the means for calculating target pressure values as recited in independent claims 1 and 13. Rather, the control system in Nishar is adapted to reduce reservoir pressure below a

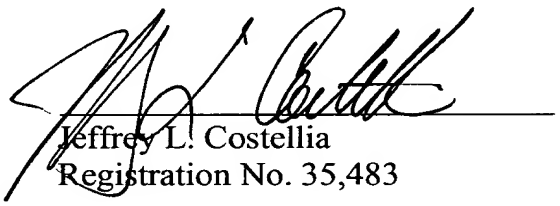
maximum threshold value in a manner similar to Tonegawa discussed above when the threshold is exceeded. Correspondingly, the noted distinctions of the present invention discussed above relative to Tonegawa are also deemed to apply to Nishar, discussion of these distinctions being omitted herein to avoid repetition. The compressor of Nishar can be deactivated if a maximum compressor temperature value is exceeded, and can be caused to operate for a set time period under certain operating conditions to maintain pressure generation. However, because Nishar fails to disclose or suggest a means for calculating target pressure values as required by the claimed invention, the applicants request the withdrawal of this rejection. In addition, Nishar also fails to disclose target pressure being higher during throttle-off modes than throttle-on modes as now specifically recited in the amended independent claims 1 and 13. Correspondingly, the allowance of claims 1, 6, 7, and 13, claims 6 and 7 being allowable at least for the reason of their dependency upon allowable independent claim 1.

Finally, the Examiner rejected claims 4, 5, and 9-11 under 35 U.S.C. 103(a) as being anticipated by Eslinger discussed above. However, this rejection with respect to claims 4 and 5 is believed to be rendered moot in view of the discussions above regarding Eslinger in that Eslinger does not disclose, teach, or otherwise suggest the recited means for calculating target pressure for a reservoir or the recited target pressures which is recited in independent claim 1 upon which claims 4 and 5 ultimately depend. In addition, with respect to claims 9-11, it is again noted that Eslinger and the other references of record, fail to teach, or otherwise suggest a control system with a means to calculate target pressure for the reservoir so that the compressor is controlled with respect to this target. Moreover, independent claim 9 further specifically recites that the target pressure is higher during the throttle-off modes than during throttle-on modes, this feature also not being disclosed in Eslinger as already discussed. Therefore, the withdrawal of this rejection, and the allowance of claims 4-5 and 9-11 are respectfully requested,

claims 10 and 11 being allowable at least for the reason of their ultimate dependency on allowable claim 9.

In view of the foregoing, it is submitted that the present application is in condition for allowance and a notice to that effect is respectfully requested. However, if the Examiner deems that any issue remains after considering this response, he is invited to call the undersigned to expedite the prosecution and work out any such issue by telephone.

Respectfully submitted,



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